Name: Date:

s17 Geometric Series Exam (Example v104)

Question 1

Consider the partial geometric series represented below with first term $a = 990$, common ratio $r = \left(\frac{31}{55}\right)^{1/10}$, and $n = 10$ terms.

$$S = 990 + 934.84 + 882.74 + 833.56 + 787.11 + 743.25 + 701.83 + 662.73 + 625.8 + 590.93$$

We can multiply both sides by r.

$$rS = 934.84 + 882.74 + 833.56 + 787.11 + 743.25 + 701.83 + 662.73 + 625.8 + 590.93 + 558$$

What is the value of $S - rS$?

Question 2

Consider the geometric series shown below, using ellipsis notation to indicate a continuation of the pattern without writing every term.

$$S = 2 + 2(5) + 2(5)^2 + 2(5)^3 + \cdots + 2(5)^{74} + 2(5)^{75} + 2(5)^{76} + 2(5)^{77}$$

Identify the initial term, the common ratio, and the number of terms.

Question 3

Write a proof for the partial geometric series formula.

a. Define the variables.
b. Write the sum using variables and ellipsis notation. You can implicitly assume the number of terms is more than the number of terms you choose to write.
c. Using annotated algebraic manipulation, produce the partial geometric series formula.